REMARKS/ARGUMENTS

The Office Action mailed November 28, 2006 has been received and reviewed. Claims 1 through 19 are currently pending in the application. Claims 1 through 19 stand rejected. Applicant respectfully requests reconsideration of the application as amended herein.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on EP 1308491 to Choy

Claims 1 through 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Choy (EP 1308491) in view of Leenders et al. (U.S. Patent No. 5,568,173) and Kasperchik et al. (U.S. Patent No. 6,585,464). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 1-19 are improper because the cited references to not teach all of the claim limitations, there is no motivation to combine the different teachings in the references, and the references (when read in their entirety) teach away from the invention.

Independent claim 1 recites a method of enhancing color space comprising depositing dye-based ink and a charged polymer fixer on a print medium in a print zone having a temperature between about 45° C and about 85° C. Independent claim 9 recites a method of inkjet printing comprising:

underprinting a charged polymer fixer fluid on a print medium in a print zone; depositing dye-based ink over the fixer fluid on the print medium; and heating the print zone to a temperature

between about 45° C and about 85° C during the underprinting and the depositing. Independent claim 16 recites a printing system capable of maintaining or enhancing chroma independent of increased ink application, the system comprising: a print zone configured to be heated up to about 85° C; and a pen set configured to apply dye-based ink and a charged polymer fixer to a print medium in the heated print zone.

Choy is relied upon as allegedly teaching an apparatus and method of enhancing color space having a pen set for depositing dye based ink and a fixer on a print medium comprising plain paper and applying heat to the print zone after or prior the depositing of the dye based ink. The Office Action acknowledges that Choy fails to teach the temperature to be between about 45 and 85 degrees. Applicant respectfully disagrees with the Examiner's characterization of Choy, but agrees that Choy fails to teach the particular temperatures recited in the pending claims.

Specifically, as discussed in the Background of the Invention, Choy deals with overcoming "short 'drytimes' *(e.g.,* less than about 1 s)" in order to "reduce surface bleed, reduce the potential for smudging, and shorten the overall print time," and teaches that "the drytime of an image is influenced by a number of factors that include the chemical composition of the deposited ink and the physical and chemical characteristics of the print medium" and that it would be desirable to provide "ink compositions that perform well in ink-jet printers on both a short and long term and show reasonable drytimes when printed on hydrophobic media." (Choy at paras. [0001] and [0007]) (emphasis added).

As expressly stated in the Summary of the Invention, Choy addresses and solves the short drytime problem by providing "methods of printing inventive inks and fixers on hydrophobic media." (Id. at paras. [0025]) (emphasis added). The methods include use of "ink compositions that include a water soluble dye and a vehicle, the vehicle including water, a glycol ether, a humectant, and a non-ionic surfactant." (Id. at para. [0008]) (emphasis added). Choy "further provides fixer compositions for stabilizing inventive inks on hydrophobic media that include a fixing agent and a vehicle, the vehicle including water, a glycol ether, a glycol ether ester or mixture thereof, a humectant, and a non-ionic surfactant." (Id. at para. [0008]) (emphasis added). More specifically, Choy teaches that the glycol ethers or glycol ether esters are added to provide "a balance of hydrophilic and hydrophobic character." (Id. at para. [0018]) (emphasis added).

Thus, Choy is drawn to methods of reducing surface bleed, potential for smudging, and reduction of the overall print time in hydrophobic media when using dye based (hydrophilic) inks. It overcomes this problem by teaching use of a glycol ether, a glycol ether ester or mixture thereof, a humectant, and a non-ionic surfactant to provide the dye-based ink with a balance of hydrophilic and hydrophobic character in order to fix the dye-based ink on the hydrophobic media and reduce smudging and print time. Choy does not teach or suggest the use of depositing dye-based ink and fixer on a print medium in a print zone that is heated to a temperature between about 45 and 85 degrees C., instead teaching another solution to the problem of printing on a hydrophobic media, that is, use of a glycol ether, a glycol ether ester or mixture thereof, a humectant, and a non-ionic surfactant. As such Choy does not teach or suggest all of the claim elements and, instead, teaches a different solution to a different problem (printing on hydrophobic media with hydrophilic inks). More specifically, Choy relies upon use of a glycol ether, a glycol ether ester or mixture thereof as a fixer to accomplish this result. In contrast, independent claims 1, 9, and 16 require a dye-based ink and a charged polymer fixer on a print medium, along with a print zone having a temperature between about 45° C and about 85° C.

Leenders et al. is relied upon as teaching use of a temperature between about 45 and 85 degrees C. after depositing ink on a medium. However, Leenders et al. does not overcome the deficiencies of Choy, as discussed above. Additionally, Leenders et al. teaches away from Choy and, therefore, provides no motivation to be combined with Choy. The object of Leenders et al. is to provide an ink jet printing method having enlarged gray scale reproduction capabilities. (Leenders et al. at Col. 3, line 65 to Col. 4, line 7). This object is achieved by using a plurality of inks having different concentrations of two reagents (reagents A and B). (Id. at Col. 4, lines 10-56). Reactants A and B are color reaction agents for metal ions (Id. at Col. 5, lines 49-52). More specifically, the "method of [Leenders et al.] produces black images of high optical density when "substances A and B represent a chemically reactive system mainly comprising a substantially colorless metal salt and a substantially colorless reducing agent producing therewith a substantially black deposit of finely divided metal in a redox reaction." (Id. at Col. 5, lines 34-42) (emphasis added).

The ink-receiving material formed by the method of Leenders et al. is a "heat-developable

photosensitive layer comprising a substantially light-insensitive silver salt, an organic reducing agent and a light-sensitive heavy metal compound, preferably light-sensitive silver halide, which upon exposure to activating electromagnetic radiation forms metal nuclei that upon heating of said layer initiate a redox reaction between the light-insensitive silver salt and the reducing agent applied by ink jet." (Id. at Col. 10, lines 4-13; emphasis added). Upon heating, the redox reaction is activated to form a silver metal image. (Id. at Col. 10, lines 22-26). After deposition of the ink image(s), the receiving material is subjected to heat treatment in the range of 40 to 160 degrees C. (preferably 100 degrees C.) to trigger the redox reaction and "obtain a desired optical density increase." (Id. at Col. 11, lines 6-16).

Thus, Leenders et al. provides no motivation to be combined with Choy, as Choy attempts to resolve the problem of using dye based (hydrophilic) inks on hydrophobic media. Choy overcomes this problem by teaching use of a glycol ether, a glycol ether ester or mixture thereof, a humectant, and a non-ionic surfactant to provide the dye-based ink with a balance of hydrophilic and hydrophobic character in order to fix the dye-based ink on the hydrophobic media. In contrast, Leenders et al. aims to provide an ink jet printing method having enlarged gray scale reproduction capabilities (as opposed to enhancement of color space, as required by the pending claims). Leenders et al. resolves this problem by using a metal salt and a substantially colorless reducing agent to produce a substantially black deposit of finely divided metal in a redox reaction, which is activated by heat to form a silver image.

Kasperchik is relied upon as teaching a charged polymer fixer. (Office action at pg. 3). However, Kasperchik does not overcome the deficiencies of Choy or Leenders et al., as discussed above. Additionally, Kasperchik teaches away from Choy and Leenders et al. and, therefore, provides no motivation to be combined with these references. The object of Leenders et al. is to provide in-line conditioning of swellable print media prior to printing through treatment with an amphiphilic solvent that further contains ionic components that accelerate precipitation of pigment or dye from the ink. (Kasperchik at Abstract). Kasperchik attempts to solve the problem of puddling or coalescence at high print speeds. This problem is overcome by providing an amphiphilic solvent that is applied to a swellable media surface prior to printing. (Kasperchik at Col. 2, lines 54-63). The amphiphilic solvent may also contain a polymer dispersant having an

opposite charge to that of a charged pigment (i.e., an anionic polymer pigment dispersant and a cationic polymer of the pretreatment liquid) in order form an insoluble salt on the print medium surface that is treated. (*Id.* at Col. 4, lines 5-13). "When the ink is deposited on the treated medium, the cationic component of the pretreatment liquid forms a salt with the anionic component of the ink, which 'crashes' out of solution rapidly. Because the removal of the dye or pigment from the solvent is so rapid, there is less dispersion of the dye or pigment, resulting in improved edge acuity." (*Id.* at Col. 4, lines 13-18; emphasis added). As recited in the Background section of the present application, fixer systems used with dye-based inks "precipitate the dye quickly, reducing dot gain and resulting in lower chroma." (Application at para. [0005]). Thus, Kasperchik simply teaches use of amphiphilic solvents with ionic components therein that rapidly crash out pigments from solution, which reduce dot gain and lower chroma, in direct contravention to the object desired by the present invention, i.e., providing a method of enhancing color space. Thus, Kasperchik teaches away from the present invention and does not overcome the deficiencies of Choy and Leenders et al. Additionally, there is no motivation to combine Kasperchik with Choy or Leenders et al., as these references solve the problems stated therein in completely different ways, as discussed above.

Even assuming that there was some motivation for combining Choy, Leenders et al., and Kasperchik, which there is not, the cited references do not provide a motivation to combine because the combination of the three references would render the method of Choy inoperable for its intended purpose. If a proposed modification would render the prior art invention being modified inoperable for its intended purpose, then there is no suggestion or motivation to make the proposed modification. M.P.E.P. § 2143.01. If the method of Choy was modified to include the methhods taught in Leenders et al. or Kasperchik, the method of Choy would be inoperable because it expressly requires a non-charged polymer fixer to accomplish its desired result.

Additionally, like Choy, Leenders et al. does not attempt to solve the same problem as the present invention, nor does it (either alone or in combination with Choy) utilize the combination of a dye-based ink and a charged polymer fixer, together with heating, to provide enhanced color space. In fact, Leenders et al. teaches away from such a solution by providing an entirely different solution to a different problem. Likewise, as previously discussed, Kasperchik also

teaches away from such a solution by using amphiphilic solvents with ionic components therein that rapidly crash out pigments from solution, which reduce dot gain and lower chroma, in direct contravention to the object desired by the present invention, i.e., providing a method of enhancing color space.

The nonobviousness of independent claims 1, 9, and 16 preclude a rejection of claims 2-8, 10-15, and 17-19 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

In view of the foregoing, applicant respectfully requests withdrawal of the present rejections and allowance of the pending claims.

CONCLUSION

Claims 1 through 19 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,

Edgar R. Cataxinos
Registration No. 39,931
Attorney for Applicant
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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